



Always refer shooters to an experienced exercise physiologist or physiotherapist for a more detailed assessment of posture and exercise prescription.

Coaching Column

exercise for specific postural variations in pistol shooting Part 2

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In the previous issue we looked at the main postural variations that occur in the spine and trunk and how they can alter the pistol shooter's technique.

Coaches who can identify these issues should not necessarily try to correct these postures. This skill should be left to qualified exercise physiologists such as those registered with the Australian Association for Exercise and Sports Science (AAESS) or accredited and experienced Strength and Conditioning coaches. Coaches who use their powers of observation can determine the best approach to take in order to assist the shooter in overcoming any such issues, which may be impacting on the shooter's performance by simply referring them to the appropriate person.

In this issue I look more closely at the postures of the hips or pelvis. Typically there are three common positions for the lower back and pelvis and they include a neutral hip position, a posterior tilt and an anterior tilt.

Neutral Hip Position – ideal

The neutral hip position is an ideal posture. A simple test to see if your hips are close to neutral is to place a ruler on top of your right hip bone and across to the top of your pubic bone. Then have someone look at you from side on. The ruler should look vertical from a side on position.

In the diagram (right) you will notice that the right hip bone and the pubic bone are nearly vertically aligned. In this ideal position the centre of mass lines up just in front of the centre of the knee joint and just behind the centre of the hip joint.



This alignment allows the joint structures to bear most of the weight in the normal stance by letting the knees lock out slightly and the hips push forward slightly. In this position the ligaments and structures of the joint actually take the load away from the muscles and allow the person to stand for long periods with less effort.

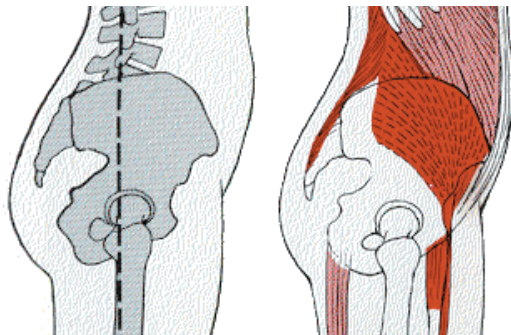
Shooters who exhibit this type of posture will generally have a more balanced stance and be able to adjust positions more easily as they will have a full range of movement and a more vertically aligned centre of balance. That's not to say that they will not have problems with tight or weak muscles. It does however mean that they are more likely to use the bones to support their mass with a better positioned pelvis allowing for a longer or more efficient stance, lower levels of fatigue and more comfort in the stance over time or throughout a match.

With this posture shooters need to maintain good abdominal control and trunk strength and should aim to continue to work on their posture to ensure that this is transferred to the shooting position. It is worth noting that good static posture, when viewed at rest, does not always mean a well aligned and stable posture during

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a dynamic motion or a shooting stance. Coaches should observe the individual during normal resting stance and in the shooting stance to identify whether there are implications for poorly aligned hips and/or trunk.

Anterior Pelvic Tilt



The anterior pelvic tilt is typified by a deeper curve in the lower back and a protruding bottom. A bigger than normal abdominal region may also occur. Shooters with this posture tend to increase their curve and stick their bottom out further as they fatigue. Sore or tired lower back muscles and stiffness in the legs will result after long periods of standing. The upper body posture will be influenced and shooters may also have their centre of mass move closer to the centre of the hip joint and further in front of the knee joint. This requires shooters with this posture to use more effort from the lower limb muscles to maintain an upright stance and there is also less likelihood of achieving a stable and static position.

Over time shooters in this category will tend to lose the ability to remain in a strong vertical position. They may attempt to adjust their stance in long matches to find a more comfortable position to relieve the stress in the lower back and try and rest the lower limb muscles. As they fatigue these shooters will develop a greater sway and look for ways to stay upright without using the same muscles that have now become the main support structures.

With an anterior pelvic tilt the external abdominal obliques, abdominals and hamstrings behave as if they are too long. These muscles need to be strengthened and shortened by specific exercises that will teach the muscles to behave shorter. Here are some examples.

Crunch and Hold

Keeping tummy sucked in. Hold this position for 6-10 seconds. Repeat 4-10 times.



Oblique Hold

Crunch up into a twisted position keeping your tummy sucked in. Hold for 4-6 seconds. Repeat 4-6 times on each side.

Hamstring Raise

Lift your hips off the floor using your leg. Hold the hips there with support from your hands for 6-10 seconds. Repeat 4-6 times on each leg.



The hip flexors, quads and lower back muscles behave in a shortened manner and they need to be stretched to make them behave longer again. Here are some sample stretches.



Thomas Stretch

Lie over the edge of a bed or table and bring one leg up to the chest letting the other leg rest down. Hold this position for 30-45 seconds on each side. Repeat.

Standing Quad Stretch

Suck your tummy in and slowly bring the ankle up towards your bottom. Stop pulling up with the ankle when you lose your sucked in tummy. Hold for 20-30 seconds. Repeat each side.

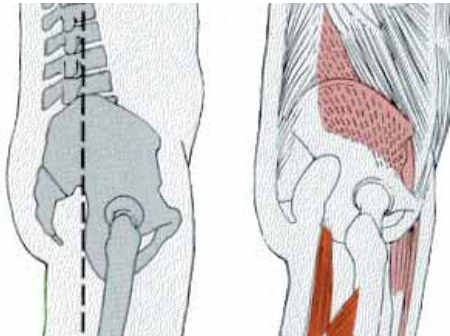




Lower Back Stretch

Sit with legs bent and apart. Slowly lean forwards trying to curve your back between your knees. When the lower back feels stretched hold for 30-45 seconds. Repeat.

Posterior Pelvic Tilt



The posterior pelvic tilt is typified by a flat lower back and a flat bottom. As fatigue sets in shooters with his posture tend to push their hips forward moving the centre of mass further behind the hip joint and placing more stress on the joint structures and muscles at the front of the thigh and hip. This posture is commonly seen in overweight men whose tummy drag them forward or in pregnant women whose changing tummy weight drag the hips forward and the trunk backwards. Generally this places more stress in the legs and there is less involvement of the abdominal and backside muscles to maintain an erect stance.

The posterior pelvic tilt can be quite stable as the person still leans into an exaggerated lock out position of the hip and knee structures, but when viewed from side on they will assume a reverse 'C' type shape. Shooters with this stance tend to lean further backwards in the shooting position as their hips are pushed forwards. Coaches need to observe how these shooters adjust their aim as they may have a tendency to use the looseness through the hips to adjust upper body stance instead of through the ankles.

In this position the hamstrings tend to behave short and tight and the hip flexors and glutes (bottom) tend to be long and weak.

Hamstrings need to be lengthened and the hip flexors and glutes need to be strengthened and shortened. Here are some examples.

Hamstring Stretch

Lying on your back, pull your knee to your chest and holding it there try to stretch the knee over your head. Your leg will shake slightly during the hold. Hold for 6-10 seconds. Repeat 3 times on each leg.



Standing Hamstring Stretch

Place your foot on a low box or step and start by sticking your bottom out. Lean forward trying not to bend your back, but gain the stretch by trying to keep your bottom stuck out more. Hold for 20-30 seconds on each leg. Repeat twice.



Bridge and Hold

Lift your hips off the floor and hold for 20-30 seconds. Repeat 4-6 times. Always try and keep your lower back curved and try not to tuck your bottom up as you lift.



Observation and providing feedback is the best and most commonly used skill to assist athletes to improve their performance. Coaches need to use this skill to provide feedback about shooters' hip position because this is the platform from which the upper body posture is maintained. When in doubt regarding a shooter's posture, make sure that you refer them to a health professional to allow them to continually develop these skills along with their shooting skills. 🌟